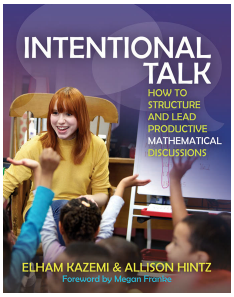
From Intentional Talk (2014) (Stenhouse Publishers)
Kazemi & Hintz.



Classroom discussions are guided by four principles:

1. Discussions should achieve a mathematical goal, and different types of goals require planning and leading discussions differently.
Mathematical Discussions focus on *Concepts, Procedures, Representations*, and *Explanations* and the interrelationships of these foci.

	Goal
Open Strategy Sharing (CH 2)	To have students share as many different ideas as possible in the discussion so they see a range of possibilities, that often leads to Targeted Discussion:
Targeted Sharing:	
Compare and Connect (CH 3)	To compare similarities and differences among strategies
Why? Let's Justify (CH 4)	To generate justifications for why a particular mathematical strategy works/makes sense
What's Best and Why? (CH 5)	To determine a best (most efficient) solution strategy in a particular circumstance
Define and Clarify (CH 6)	To define and discuss appropriate ways to use mathematical models, tools, vocabulary, or notation
Troubleshoot and Revise (CH 7)	To reason through which strategy produces a correct solution or figure out where a strategy went awry

2. Students need to know what and how to share so their ideas are heard and are useful to others.

a. We can use and offer **sentence starters** that *cue students to know what to say*:
"Explain to me what you meant by _____,"
"What would you do if the number was _____?" and
"How is your way different from _____?"

b. We also help students **learn *what to listen for*** so they can contribute to the conversation:
"Listen for how she broke apart the numbers," "Think about whether you are understanding how she used the number line to show her thinking."

c. Similarly, students ***learn how to share*** through our explicit support. *Reinforcing norms* supports students in knowing how to share. For example, you might need to reinforce
where to place oneself : "Stand here so we can see your work"; "Sit knees to knees with your partner so you can listen to each other.";
how loudly to speak: "Speak loudly so everyone can hear your idea"; and
what tools to use: "Use the drawing in your journal to help."

3. Teachers need to orient students to one another and the mathematical ideas so that every member of the class is involved in achieving the mathematical goal.
Teachers can draw attention to the meaningful contributions that all students make and can encourage students to take risks by "assigning competence," or identifying and naming students' specific contributions

4. Teachers must communicate that all children are sense makers and that their ideas are valued.
How we respond to errors and partially developed ideas sends important messages about taking risks. It is not easy for students to express their ideas if there is a high burden to be correct and understand everything the first time around. Being smart in mathematics is not just about speed and accuracy. We want all students in the class to regard themselves as mathematical thinkers and to see themselves as people who can grow and be successful.

Open Strategy Sharing:
In open strategy sharing, students listen for and contribute different ways to solve the same problem. The teacher asks how questions, such as "How did you think about the problem?" and sometimes why questions, like: "Why did you start with the seven?"
Most important, the teacher invites children to share by asking: "Who did it a different way?" Students are oriented to tracking and repeating their classmates' strategies to show they understand what their peers did. The goal of open strategy sharing is to bring out a range of possible ways to solve the same problem and build students' repertoire of strategies.

Class Norms for Open Sharing.
In class we will:

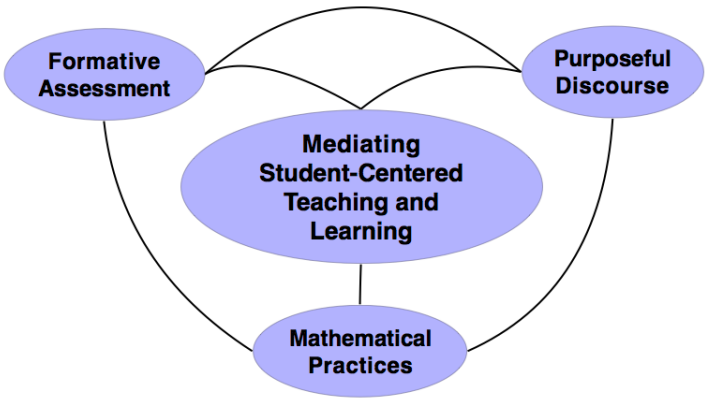
- Make sense of mathematics
- Keep trying even when problems are challenging
- Remember that it's okay to make mistakes and revise our thinking
- Share our mathematical ideas with our classmates (whether we are using words, numbers, pictures, gestures, or tools)
- Listen to understand someone else's idea; give each other time to think
- Ask questions that help us better understand the mathematics
- Agree and disagree with mathematical ideas, not with each other
- Remember that everyone has good mathematical ideas

Talk Moves to Support Classroom Discussions	
Revoicing *"So you're saying . . ."*	• Repeat some or all of what the student has said, then ask the student to respond and verify whether or not the revoicing is correct. Revoicing can be used to clarify, amplify, or highlight an idea.
Repeating *"Can you repeat what she said in your own words?"*	• Ask a student to repeat or rephrase what another student said. • Restate important parts of complex idea in order to slow the conversation down and dwell on important ideas.
Reasoning *"Do you agree or disagree, and why?"* *"Why does that make sense?"*	• After students have had time to process a classmate's claim, ask students to compare their own reasoning to someone else's reasoning. • Allow students to engage with each other's ideas. • Student: "I respectfully disagree with that idea because . . ."; "This idea makes sense to me because . . ."
Adding On *"Would someone like to add on to this?"*	• Prompt students, inviting them to participate in the conversation or to clarify their own thinking. • Student: "I'd like to add on . . ."

Wait Time *"Take your time . . ."*	• Wait after asking a question before calling on a student. • Wait after a student has been called on to give the student time to organize his or her thoughts. • Student: "I'd like more time . . ."
Turn-and-Talk *"Turn and talk to your neighbor . . ."*	• Circulate and listen to partner talk. Use this information to choose whom to call on. • Allow students to clarify and share ideas. • Allow students to orient themselves to each other's thinking.
Revise "*Has anyone's thinking changed?*" "*Would you like to revise your thinking?*"	• Allow students to revise their thinking as they have new insights. • Student: "I thought . . . But now I think . . . because . . ." "I'd like to revise my thinking."

Planning Protocol:

1. (TASK) Pick a problem that can be solved in more than one way. Anticipate what children might do to solve the problem.
2. (WORK FORMS) Decide whether you want children to work on their own, in partners, or in groups to solve the problem.
3. (LAUNCH) Pose the problem, making sure students understand the problem and have a way to get started. (EXPLORE) Take anecdotal records while they work.
4. (SHARE) Have students share out two to four different ways to solve the problem. Use talk moves (see table above) and clear representation to help students understand what they hear.
5. (SUMMARIZE) Close by highlighting the different ways students thought about the problem.



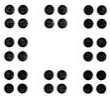
Appendix A: Planning Template for Open Strategy Sharing Discussion

Open Strategy Sharing		
Problem to pose		
Why I chose this problem		
Opening the lesson		
How might my students solve this problem?	**Who solved it this way?**	**Who should share today?**
Notes to myself about what I'm looking for		
Other strategies that emerged during the lesson		
Closing the lesson		

Example Open Strategy Plan (grade 4 multiplication)

Open Strategy Sharing

Problem to pose

Pose quick image 

Why I chose this problem	Applying multiplication strategies to count all; seeing and using groups of dots to count how many
Opening the lesson	Brief intro to keep eyes on document camera. "Your job is to figure out how many dots. I want to hear how you know."

How might my students solve this problem?	**Who solved it this way?**	**Who should share today?**
9 fours if all were filled out—imagine the group of 4 missing in the middle. 9 x 4 – 4	Ayoub	Share second
Fours in columns: 3 fours and then 2 and then 3 more 12 + 8 + 12	Divina	Start with this one
Counting fours around the perimeter	Olivia	Share third

Notes to myself about what I'm looking for

How are students using groups to figure out how many? I really want students to make sense of each other's ideas.

Other strategies that emerged during the lesson		

Closing the lesson	Reinforce that there are different ways to decompose and see the image.

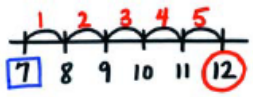
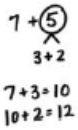
Targeted Discussion
COMPARE AND CONNECT

- **Decide which strategies** you want your students to compare and connect.
- **Identify connections** that you believe are important for students to notice between the two or more strategies.
- On your planning sheet, **write out the strategies** like you imagine they will be recorded on the board. (Add more columns to the planning sheet if you are comparing more than two strategies.)
- **Anticipate** what students may notice as they compare and connect the strategies and how you might respond to support their ideas.
- Jot a note to yourself about **the mathematical idea** you want to target during the discussion and highlight at the end of the discussion. Put the note in your pocket so you can quickly remind yourself during the discussion.

As you facilitate the discussion, **stay focused on the targeted strategies and the key mathematical idea**. It can be tempting to pursue other interesting ideas that may emerge (as we do in an open strategy share); however, *a Compare and Connect discussion is all about delving into the connections between the strategies of focus*.

Grade 1:

Compare and Connect

Strategy 1	Strategy 2
7 + 5 Counting on by ones on fingers or a number line  	7 + 5 = 7 + 3 + 2 Split up the 5 into 3 and 2 and combine 7 with 3 to make 10, and then add 2  7 + 3 = 10 10 + 2 = 12

What connections are important for students to notice?

You can start with 7 and count on the five one by one. Or we can break up the five into chunks that allow us to easily make tens.

Supporting students' thinking

What students might notice	How I might respond to support their thinking
Both started at 7.	Why does starting at 7 make sense? How did the strategies use the second number?
Both got 12.	How did the strategy help get to 12?
One broke up 5 and added three numbers: 7, 3, and 2.	Where did the 3 and the 2 come from? Could you break up the 5 into a 4 and a 1? Why was it useful to break the 5 up that way?

What is the key mathematical idea I want to highlight?

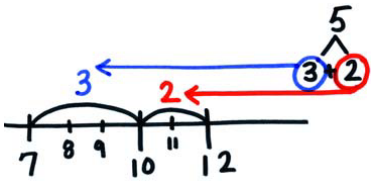
Breaking up the second number into chunks that easily make tens makes counting the total efficient.

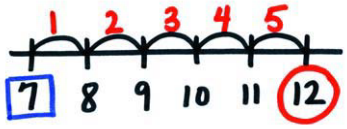
Note that there are other strategies possible for 7 + 5.

We will focus on these two strategies to ask the children to compare.

We essentially do decomposing and then apply the associative property of addition.
Students may also consider breaking up 7 into 2 and 5

Note that the first addend can be decomposed as well.





We can also use the Rekenrek with this reasoning.

You may want to have a Compare and Connect discussion in these situations:

- The problem can be solved in more than one way, and you know, based on your students, that they will have a variety of ways to approach it.
- You want to support your students in making sense of the different strategies that they have generated in order to make sure students don't see the mathematics in the solutions as disconnected.
- You're prompting students along to a slightly more sophisticated strategy.
- You want to compare the use of two different mathematical tools or representations to solve the problem.

Reflect on these questions:
1. When do you think a Compare and Connect discussion would be most useful in a unit you are about to teach?
2. This discussion structure could be useful in helping students see connections between their invented strategies and standard algorithms. How might this discussion structure help students really make sense of the notation in standard algorithms?
3. What kinds of anchor charts or displays could you keep after a Compare and Connect discussion to support students' work as you move through a unit?

Appendix B: Planning Template for Compare and Connect Discussion

Compare and Connect	
Strategy 1	**Strategy 2**
What connections are important for students to notice?	
Supporting Students' Thinking	
What students might notice	**How I might respond to support their thinking**
What is the key mathematical idea I want to highlight?	